



Nontraditional Intelligence, Surveillance, and Reconnaissance

Making the Most
of Airborne Assets

Michael S. Cornelius

Major, USAF

Air Command and Staff College

Wright Flyer Paper No. 50



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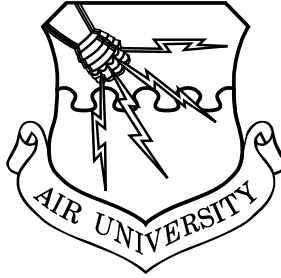
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Surveillance, and Reconnaissance**

Making the Most of Airborne Assets

MICHAEL S. CORNELIUS
Major, USAF

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Contents

List of Illustrations	<i>v</i>
Foreword	<i>vii</i>
About the Author	<i>ix</i>
Acknowledgments	<i>xi</i>
Abstract	<i>xiii</i>
Nontraditional Intelligence, Surveillance, and Making the Most of Airborne Assets	1
Abbreviations	17
Bibliography	21

Illustrations

Figure

1	Notional ISR synchronization matrix	6
2	Sample ATO sortie flow showing planned XCAS/convoy escort sorties	6
3	VDL-equipped Sniper XR/ATP	7
4	PED management team organization	9

Foreword

It is my great pleasure to present another issue of *The Wright Flyer Papers*. Through this series, Air Command and Staff College presents a sampling of exemplary research produced by our residence and distance-learning students. This series has long showcased the kind of visionary thinking that drove the aspirations and activities of the earliest aviation pioneers. This year's selection of essays admirably extends that tradition. As the series title indicates, these papers aim to present cutting-edge, actionable knowledge—research that addresses some of the most complex security and defense challenges facing us today.

Recently, *The Wright Flyer Papers* transitioned to an exclusively electronic publication format. It is our hope that our migration from print editions to an electronic-only format will fire even greater intellectual debate among Airmen and fellow members of the profession of arms as the series reaches a growing global audience. By publishing these papers via the Air University Press website, ACSC hopes not only to reach more readers, but also to support Air Force-wide efforts to conserve resources. In this spirit, we invite you to peruse past and current issues of *The Wright Flyer Papers* at http://aupress.maxwell.af.mil/papers_all.asp?cat=wright.

Thank you for supporting *The Wright Flyer Papers* and our efforts to disseminate outstanding ACSC student research for the benefit of our Air Force and war fighters everywhere. We trust that what follows will stimulate thinking, invite debate, and further encourage today's air, space, and cyber war fighters in their continuing search for innovative and improved ways to defend our nation and way of life.



THOMAS H. DEALE
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About the Author

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Abstract

This paper uses nontraditional intelligence, surveillance, and reconnaissance (NTISR), now known in tactics, techniques, and procedures as operations reconnaissance, as a case study to increase combat capability across multiple weapon systems within the Air Force. NTISR demonstrates how one capability can flex to bridge gaps across several doctrinal functions and mission sets. It also provides an argument for the development of future technologies within extant fiscal constraints, revealing a requirement to shift the acquisition weight of effort away from traditional niche assets to those that support true multirole capabilities.

Nontraditional Intelligence, Surveillance, and Reconnaissance

Making the Most of Airborne Assets

Desperate times call for desperate measures, which is exactly what happened when the 2011 Budget Control Act (BCA) mandated \$487 billion in cuts across the Department of Defense (DOD) over the next 10 years. The drastic measures call for an equally massive review of strategy, force structure, readiness, and modernization across all services.¹ The Air Force, at a 60-year low in personnel strength, plans to trade size for quality in an effort to become a more agile and responsive force.² Part of this trade requires a migration from traditional niche platforms to ones that support multirole capabilities. Fortunately, the Air Force has an excellent case study it can use to actually accomplish these goals: nontraditional intelligence, surveillance, and reconnaissance (NTISR). NTISR is a combat-proven capability that epitomizes agility and flexibility. Strike aircraft have been adapted to meet the increasing demands placed on niche ISR aircraft for the last decade, modifying their tactics to fill increasing gaps in ISR capacity. Unfortunately, NTISR is far from perfect because it employs relatively limited capabilities; the information gathered is fleeting, and it suffers from organizational and ownership issues that only hinder its usage. In order to gain the flexibility and agility required to migrate from niche to real multirole capabilities, the Air Force must learn from and address these issues with NTISR. Despite its flaws, NTISR is an overlooked and often untapped capability that could change future operations across almost every flying platform.

As a case study, NTISR forces the Air Force to reevaluate its ability to prepare for the next conflict, especially considering the acquisition of new platforms and capabilities.³ In general, the military has a poor historical record when it comes to predicting who the adversary will be, what it is we will fight about, and even when and where the conflict will occur. This is especially important when investing large sums of money in technologies designed specifically with these anticipated conflicts in mind. Because the Air Force cannot realistically predict the future, it behooves its leaders to plan for a certain amount of flexibility and multirole capability with respect to their invested platforms and related capabilities. NTISR is a gap-fill, yet multirole, capability, using nontraditionally designed platforms to service shortfalls in ISR sensor coverage. The flexibility of NTISR reveals possibilities beyond specific platforms. The Air Force has

an opportunity to capitalize on lessons learned from NTISR, and it should not wait until the next conflict erupts to start implementing it.

NTISR is priority number six on the Secretary of the Air Force's (SECAF) ISR review task list. The task list addresses the potential for tactical NTISR capabilities by each platform and includes other possibilities including capabilities not currently in production.⁴ While the office of primary responsibility (OPR) is Air Combat Command (ACC), this task supports several other major Air Force commands. The lead agency tasked to develop the NTISR road map is AF/A2 (USAF Deputy Chief of Staff for Intelligence, Surveillance, and Reconnaissance), not AF/A3/5 (USAF Deputy Chief of Staff for Operations, Plans, and Requirements)—or a combination of the two. Their challenge is to develop a road map that includes potential platform and sensor mixes, requirements for communication pathways, personnel training requirements, and a concept of operations (CONOPS) development.⁵ This enormous undertaking is of paramount importance if the Air Force is to truly fulfill its goal of becoming a more agile and responsive force, especially in these fiscally constrained times.

Although NTISR is not a new concept to military operations, it formally evolved to fill an operational gap between the available and required ISR capability to hunt SCUDs in Operation Iraqi Freedom (OIF).⁶ Because of the low-density/high-demand (LD/HD) nature of traditional ISR platforms, ad hoc means were implemented to provide a gap-fill capability. Various sensors on different aircraft were employed to hunt the mobile SCUDs, from electrooptical/infrared (EO/IR) targeting pods on fighter aircraft to ground moving target indicator (GMTI) and synthetic aperture radar (SAR) systems on the F-15E and B-1 bomber.⁷ SCUD hunting was a difficult mission and one that had limited success, but it did prove that traditional niche air assets could successfully flex to support NTISR roles.⁸

When hostilities kicked off in 2001, several targeting pods were available that provided varying qualities of EO/IR data to the relatively new NTISR capability. These included the first-generation forward-looking infrared (FLIR) low-altitude navigation and targeting infrared for night (LANTIRN) pod, and Litening advance targeting pod (ATP). LANTIRN utilized first-generation technology originally developed in the 1980s.⁹ Though Litening was newer technology from 1999, the capability was originally only available on Air National Guard (ANG) and Air Force Reserve Command (AFRC) aircraft. The pod was eventually distributed to a wider range of systems and users, such as the B-52 and the AV-8B as well as the Royal Australian Air Force and Israeli Air Force, to name a few.¹⁰ In 2002 some active and Guard strike aircraft were upgraded to utilize the third-generation

Sniper extended range (XR) ATP for support of Operation Enduring Freedom (OEF) and eventually OIF. Not only was the picture quality better with the Sniper XR but also the quality of data derived was much better, such as accuracy of coordinates.¹¹ However, all of these capabilities were still locked into individual pieces of ISR.

As an ad hoc capability, NTISR provides only a fraction of the sensor coverage that traditional ISR aircraft perform. This is a limitation of the sensors employed by the vast majority of aircraft that support NTISR, which are mostly via EO/IR pods. NTISR supports imagery intelligence (IMINT) when employing EO/IR pods such as Litening or Sniper.¹² While strike aircraft such as the B-1 and F-15E can use onboard GMTI or SAR to support ground operations, the majority of joint tactical air strike requests (JTAR) by ground units are for some sort of EO/IR sensor.¹³ The emphasis on an EO/IR capability came about because of a growing need for nonkinetic reconnaissance and surveillance support demanded by current counterinsurgency (COIN) operations. This leans very heavily on the EO/IR capability that the various pods provide.

Though these EO/IR pods are highly capable sensors, they are still pigeonholed into support of IMINT. Their capabilities were designed primarily for ground targeting, but are now used for nontraditional purposes. For example, the IR marker on the Sniper XR has the ability to provide situational awareness (SA) to other aircraft and the ground commander during night operations, as well. Its onboard laser allows the aircraft to obtain highly accurate coordinates not only for employment of ordnance, but to provide locations of different points of interest (POI) for the ground commander. Current tactics also allow aircraft to buddy lase, which involves one aircraft releasing a laser-guided munition while the other aircraft guides it in with the laser on its targeting pod. The laser spot search (LSS) and laser spot tracker (LST) functions allow one aircraft to essentially drag the other aircraft's pod onto a specific POI. Though originally designed for targeting, their unique capabilities provided built-in flexibility.

While most Air Force strike aircraft now employ the Sniper XR targeting pod with similar tactics, techniques, and procedures (TTP), their capabilities can differ. For most fighter aircraft, the Sniper XR integrates with onboard avionics, providing quick and easy access of data derived from the pod. Some aircraft, such as the B-1 bomber, did not get that capability until recently. Even then, this capability was integrated through an onboard laptop computer (LCTP or laptop controlled targeting pod) and an additional track handle, which only added to the human factors problems. Because the pod integrates with onboard aircraft systems, such as an inertial navigation system (INS), accuracies in coordinates derived

from the sensor can vary significantly across different platforms. Finally, loiter time of the platform and whether or not there are multiple aircraft (such as a two-ship of fighters) can affect employment and overall capability. Strike aircraft, though employing the same sensor, may produce different levels of effects to the ground commander.

Ground units often request effects-based capabilities. A requirement for something other than an EO/IR capability can automatically limit the options. This results from a combination of limited traditional ISR assets and the narrow capabilities NTISR assets employ. Even if they only require full motion video (FMV) through a platform such as the MQ-9, their request still depends on where it falls on the priority list. The same is true for other types of intelligence. Electronic intelligence (ELINT) and communications intelligence (COMINT) are additional capabilities ground units routinely request for operations, though they are unsupportable via an EO/IR pod. Onboard systems, such as an aircraft's radar warning receiver (RWR), were not designed to support these types of requests, especially for support of COMINT. Therefore, the ground unit must obtain access to a traditional ISR asset. The ground unit may try to piece together capabilities from different sensors on various aircraft in order to get some semblance of a complete picture if the unit is low on the priority list. This could involve using an RC-135 for COMINT and a Sniper-equipped F-16 for pseudo-FMV. Unfortunately, this is difficult to achieve at the operational level because of problems with priority, availability of assets, and the overall construct of NTISR itself.

As a capability, NTISR has the potential to provide unmatched agility and flexibility to the air and ground commander. However, this was not due to deliberate planning by the Air Force. Instead, the scramble to support LD/HD ISR assets with a gap-fill capability resulted in a new capability: NTISR. Unfortunately, little thought is given to actual integration of NTISR because of some limitations of the capability in its current form.

Though there is an EO/IR capability, the pseudo-FMV that NTISR provides is not persistent. Most strike aircraft cannot loiter as long as smaller remotely piloted aircraft (RPA). GMTI and SAR capabilities exist on strike aircraft such as the B-1 and F-15E, but these capabilities are of limited use to the ground commander for relatively small amounts of time, or unless weather negates use of an EO/IR capability. Plus, there is no consistent way to exploit that data once the aircraft returns from the mission. Therefore, narrowly defined capabilities result in limited use by ISR planners and the ground commander. This limits integration at the operational levels unless gaps exist that require immediate attention based on priority, which usually happens in a dynamic instead of a planned fashion.

NTISR is more of a capability than a mission, which does not lend it easily to structured planning.¹⁴ Close air support (CAS) and ISR are missions that are routinely planned. As such, these missions get both apportionment and allocation of assets. Conversely, NTISR is a capability that strike aircraft normally execute within the confines of on-call CAS (XCAS). Even then, NTISR divides further into subsets commonly labeled as *armed overwatch* and *armed surveillance*. Armed overwatch is direct support of ground commanders by strike aircraft providing situational awareness for a maneuver, such as convoy escort. Armed surveillance is a bit different, with strike aircraft providing real-time information during inactive periods on the ground.¹⁵ Regardless of whether the strike aircraft executes the NTISR subset of armed overwatch or armed surveillance, it is usually labeled as XCAS on the air tasking order (ATO). This lack of formal processes resembles the current best practices recommended by the Air Force Tactics, Techniques, and Procedures (AFTTP) 3-3.AOC, *Operational Employment—Air Operations Center* 12 March 2012, which does not include deliberate planning for NTISR (fig. 1). Interestingly, this involves creating and posting an NTISR collection spreadsheet to the AOC web page and e-mailing it to various flying units.¹⁶ It is supposed to be updated for each ATO day and list assignments in priority order, providing a way to determine not only available assets for tasking, but also their proximity to supported ground units. This highlights how NTISR is a “just in case” capability, something that is not deliberately planned for yet has detrimental effects on the battlefield if not properly utilized.

NTISR can fill gaps in traditional ISR coverage so long as assets are available. If assets are reoled, it could potentially involve multiple players and processes within the AOC (fig. 2). The senior intelligence duty officer (SIDO) is responsible for execution of ISR missions and therefore has first-hand knowledge as to whether or not gaps exist in requested coverage. On the other hand, the senior operations duty officer (SODO) is responsible for execution of all strike missions, which often include XCAS. Though the majority of US strike aircraft employ the Sniper XR or Litening pods, coalition or other joint aircraft may not have this particular or similar capability. The liaison officer (LNO) could also get involved in questions about specific capabilities. Though this is not particularly complex, it does involve multiple actors. Comparison of priorities must occur between intelligence and operations, which may result in ISR coverage gaps that do not get serviced. These processes at the operational level get complicated due to ownership issues. This forces ground units that do not get priority for ISR to circumnavigate the red tape in order to get the support they require.

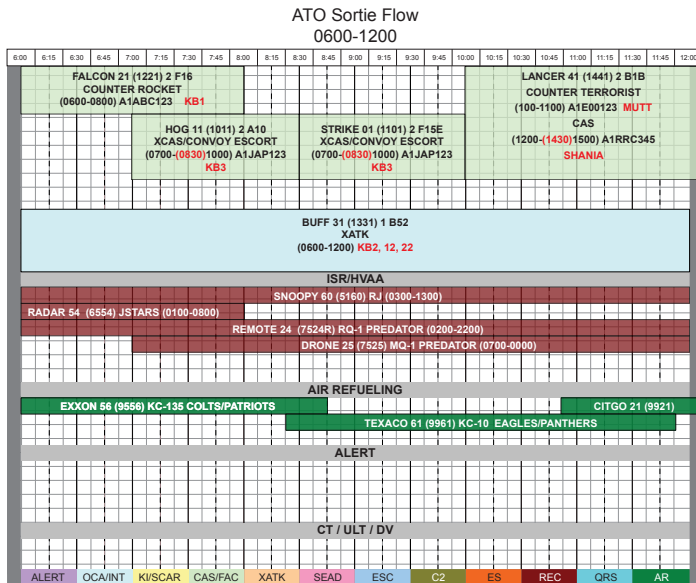


Figure 1. Notional ISR synchronization matrix. Displays lack of overlap for notional assets such as the RC-135 (RJ), EP-3, U-2, and COBRA BALL; no integration of NTISR. (*Reprinted from Air Force Tactics, Techniques, and Procedures 3-3–AOC, Operational Employment Air Operations Center, 12 March 2012, 6–100.*)

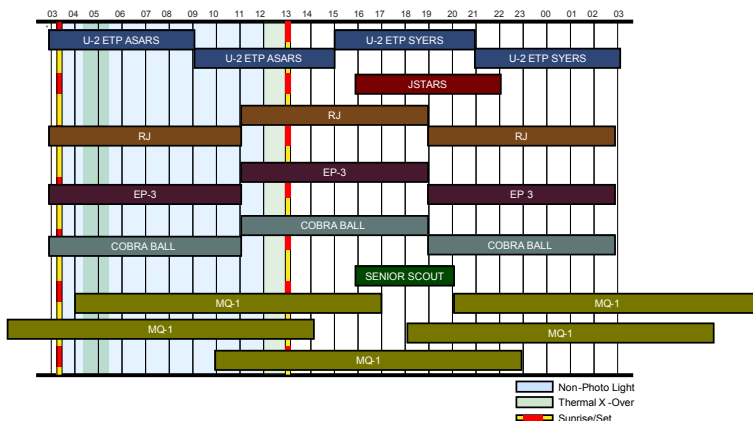


Figure 2. Sample ATO sortie flow showing planned XCAS/convoy escort sorties—likely NTISR candidates. (*Reprinted from Air Force Tactics, Techniques, and Procedures 3-3–AOC, 4-42.*)

The issue of ownership is something the NTISR capability needs to overcome to ensure true joint operations, even within the Air Force. Currently, most NTISR assets “belong” to operations, not intelligence. This is contrary to traditional ISR assets, which belong to intelligence and not operations. Pulling a strike asset from a mission such as XCAS to operate in an NTISR capacity is usually not that difficult, mainly because XCAS is a capability placeholder for an aircraft that does not have an assigned JTAR.

However, it becomes more difficult when that strike asset is supporting an equal-or-higher priority JTAR. If the strike asset is involved with a troops-in-contact (TIC) situation, that possibility is nil.¹⁷ In any case, the strike asset must get cleared to transition from its primary assigned mission to pick up an alternate mission such as XCAS.

Similar to the JTAR for strike requests, requests for ISR emphasize the importance of specific required effects. Some of the ISR effects include signals intelligence (SIGINT), GMTI, FMV, and any combination of EO, IR, and SAR.¹⁸ The request for these required effects clearly points each capability toward specific platforms. For instance, GMTI, unless it comes from an NTISR asset such as the B-1 or F-15E, is a capability that only the E-8 Joint Surveillance Target Attack Radar System (JSTARS) brings to the fight. Traditional FMV is a capability the MQ-1 and MQ-9 offer, yet a pseudo version is available with the platform employing the Sniper XR equipped with video downlink (VDL) (fig. 3).



Figure 3. VDL-equipped Sniper XR/ATP. (USAF photograph by SSgt Darnell Cannady.)

Additionally, EO, IR, and SAR capabilities exist on the MQ-1, MQ-9, and U-2. Requests help to narrow required effects to specific ISR platforms, but they do not take into account the capabilities of NTISR. Assigning a strike asset to an ISR primary mission will not happen.

Very few, if any, of OEF combat sorties over the last decade were originally planned as NTISR.¹⁹ NTISR is actually a capability executed within XCAS, either as armed overwatch or armed surveillance.²⁰ Ground units routinely request CAS and then use the aircraft in a nontraditional role, such as scanning lines of communications (LOC) for improvised explosive devices (IED), convoy escort, or tracking suspect individuals with a targeting pod. Sometimes ground units are not even outside the wire for these requests, viewing the aircraft's VDL feed through a remotely operated video enhanced receiver (ROVER) from the inside of the tactical operations center (TOC), which is how armed surveillance came about. Combat strike aircraft effectively turn into ISR platforms for the supported ground unit, providing a kind of pseudo-FMV through its VDL feed to the ROVER. This identifies how ground units figured out how to circumnavigate the red tape involved at the higher coordination levels, finding ingenious ways to get the desired effect they require while also preserving an adequate kinetic option.²¹ It is just the nature of the current beast as LD/HD platforms are unable to fulfill 100 percent of requests for traditional ISR.

Transitioning between traditional and nontraditional ISR roles is a prime example of flexibility, a tenet of airpower the Air Force understandably embraces. As demands for ISR increased by approximately 3,000 percent over the last decade, the Air Force had to find ways to increase supply.²² While this sends the Air Force on the path of achieving its goal of 65 combat air patrols (CAP) by 2013, it does not necessarily embody flexibility. The Air Force reacted to the additional CAPs with increased acquisitions of the MQ-1 and MQ-9. August of 2011 finally saw the full complement of 268 MQ-1s reached, with 79 of a planned 400 MQ-9s also acquired.²³ Increased demands for the persistent coverage that remotely piloted aircraft offer have caused the Air Force to become unnecessarily shortsighted. These aircraft, while filling an operational requirement, currently enjoy a threat-permissive environment and are not especially agile.

Unfortunately, the data NTISR collects are usually fleeting. The images and weapon system video (WSV) obtained from the aircraft are usually not included in processing, exploitation, and dissemination (PED). They are used for that operation and then they are gone, unless incorporated into a larger requirement such as the location of IEDs. Necessity drove invention with reporting specific data following NTISR operations. This

process was a result of the increased IED activity in both OIF and OEF and the inability of LD/HD ISR assets to fulfill the requirement. Named an EYELID report, it was something an aircraft conducting XCAS or NTISR provided the operations center either immediately or upon completion of its vulnerability period in Iraq or Afghanistan.²⁴ It involved EO/IR-capable aircraft scanning LOCs for suspicious activity or locations of IEDs. As with the SCUD hunt during the early parts of OIF, EYELID reports were not particularly effective. Though initially a good concept, finding IEDs using EO/IR capabilities fell short because of the combining of the EO/IR capabilities, the high false alarm rate, and the processes involved with PED. Duplication of effort was common because the data gleaned from EYELID reports rarely made it back to the aircrew supporting the mission, which increased the amount of similar information coming into the AOC.²⁵ The potential increases in data that NTISR provides lead to questions of PED because of potential increased personnel requirements to accomplish this feat, not just a deconfliction of effort.

The larger amounts of data mean nothing if there is not an equally large number of personnel for PED. There was a 1,500 percent increase in the volume of data associated with traditional ISR with a minuscule increase in the ability of PED since combat operations began in 2001.²⁶ The inclusion of data from NTISR could potentially overwhelm the system if it is deemed worthy of analyzing. Currently there are multiple teams responsible for roughly the same product when it comes to PED, although the PED management team within the ISR division (ISR Division) is specifically assigned the task (fig. 4).²⁷

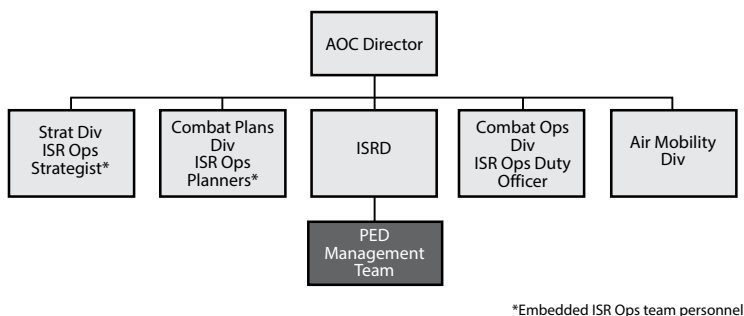


Figure 4. PED management team organization. (Reprinted from AFTTP 3-3-AOC, 6-121.)

Duplication of effort does not help the Air Force toward its goal of cost efficiency. The Air Force cannot afford to have a smaller force executing the same functions; something has to give.

Automation is one area the Air Force should consider to solve the problem of increased data bogging down the ability of PED. The current primary source of potential intelligence within NTISR involves IMINT, specifically static images and WSV. Plenty of data is available to support PED, like coordinates (latitude, longitude, and elevation), slant range, type of image (IR/TV), observed object type (building, individuals, etc.), orientation (relative to true north), and even an object's relative size. Tagging or embedding this data into each image or video helps ease the organization of information and search process once it is posted into a common database. This is similar to new processes implemented within the RPA fleet for tagging FMV.²⁸ Once each image is tagged with the appropriate information and sent forward for possible PED, automation could take over to help analysts determine whether or not the data deserves more study.²⁹

A single database with a more powerful search engine for submitting and distributing acquired ISR data is required. There are several opportunities to input the same data into various systems, increasing the likelihood for duplication of effort. Unit intelligence personnel should imbed appropriate information the data obtained from NTISR assets before submitting it for further PED, such as the aforementioned data available from current targeting pods (coordinates, elevation, etc.). Key imbedded and searchable information will help determine whether that data is useful for further PED. There must be a streamlining of effort that also allows technology to work for the various users, not against them. If not, there is a risk of suffering from the autonomy paradox, which states that the systems designed to reduce the need for human operators will require more manpower to support them, much like the support structure required for each RPA CAP.³⁰

Currently, both the National Geospatial-Intelligence Agency (NGA) and Director of National Intelligence (DNI) are working toward integration of data into a shared cloud architecture. This migration makes accessing the data more secure and faster, plus adds an extra benefit: mobility. Over 7 million pieces of information technology (IT) infrastructure are within both the National Security Agency (NSA) and the DOD. Moving this infrastructure to a cloud environment with shared databases enables the intelligence community (IC) to perform deeper analysis.³¹ Moving data gathered from both traditional and nontraditional ISR assets to a cloud architecture has the potential to increase capability and streamline operations.

Technology can assist the Air Force in becoming a more agile, flexible, and ready force in the face of looming manpower and budget cuts. With each RPA CAP requiring 120 personnel, this seems like a tall order, especially with the goal of attaining 65 CAPs by 2013.³² Current Air Force priorities favor multirole platforms over those with narrowly focused capabilities.³³ Interestingly, a large amount of its budget and effort is geared toward supporting platforms that will not deliver that multirole capability for several years. Platforms such as the F-35, the long-range strike bomber, and the KC-46 tanker still resemble those with traditional niche capabilities. In fact, the *United States Air Force Posture Statement* gives the KC-46 top priority followed by the F-35; ISR systems are third followed by the long-range strike system and space capabilities.³⁴ This makes the case for a cheaper multirole alternative extremely appealing to a fiscally constrained force.

Promoting multirole capabilities and executing this plan are two different things the Air Force must bring together. Though NTISR currently suffers from a lack in breadth of capability, it still provides a potential launching point for future multirole ideas. The Sniper XR is a very capable system and is transferrable between different types of aircraft, adding not only a capability, but multiple roles. This same concept could be applied to an entirely new collection pod with additional capabilities (multispectral, hyperspectral, light detection, and ranging [LIDAR], etc). This collection pod requires standardization, similar to the Sniper XR, but also to how combat aircraft utilize standard weapons. For instance, the GBU-38 (guided bomb unit), a 500 lb class weapon, is easily transferrable between different combat aircraft. The lug spacing required to attach it to the aircraft is the same at 14 inches, with the addition of a fuze and an umbilical connecting to the aircraft. The only difference is how the GBU-38 reaches its target; the delivery method changes. The same is true for a possible collection pod, whether that delivery method is low, high, fast, persistent, and so forth. However, developing such a pod would require commitment of time and money by the Air Force. It certainly would be time and money well spent. A new collection pod would increase capability, provide more flexibility, and make the Air Force much more agile than it is in its current form.

Though the advisability of investing time and money into a new system may seem flawed, it is quite the opposite. The Air Force's budget specifically protects science and technology funding.³⁵ Being agile, flexible, and cost-effective is the way ahead, and a new collection pod will benefit the Air Force across all of these goals. The Air Force is already cutting 280 aircraft across a wide range of capabilities, such as the A-10, F-16, RQ-4 Block 30, E-8, and multiple airlift/tanker assets.³⁶ Personnel are also seeing

reductions, with 9,900 active-duty, Guard, and Reserve Airmen being cut based on a new force restructuring. These are the first of many sacrificial lambs the Air Force must abandon in order to continue funding other programs, such as the F-35, MQ-9, modern radars, precision munitions, and contributors to the new Air-Sea Battle Concept.³⁷ Adding a collection pod would not only help fill a capability that is currently LD/HD, but also would provide a sensor that is well worth the investment for future conflicts.³⁸

ISR assets will always be in high demand because information is what drives military decision making. Finding a commander that requests the least amount of information possible would be a difficult task in today's military. The Air Force reacted to increasing ISR requests with a near-equal increase in assets that could support the mission and fill the requirement. Fortunately, there is a way ahead. An additional collection pod would not only help augment the LD/HD assets in the current fight, but provide an undeniably beneficial capability to any current or future combatant commander, no matter what the area of responsibility (AOR). This collection pod should also be considered for Air Mobility Command (AMC) aircraft, such as the C-130 and KC-135. Having a highly adaptable and modular force is the essence of flexibility. Instead of spending an enormous amount of money on capability-specific aircraft, the Air Force should focus on augmenting current aircraft with multiple capabilities. This would help realign the Air Force to its goal of becoming more responsive, agile, and cost-effective.

The additional capability a collection pod brings to the current and future fight is worth rigorous examination. A total of 522 pods have been produced at \$1.6 million each for a total of \$835.2 million.³⁹ The low-rate initial production (LRIP) batch cost of a single F-35 is currently at \$203.4 million. This will only increase in the short term, with the F-35C variant estimated at \$235.8 million per aircraft.⁴⁰ The total production of Sniper pods is the equivalent of four F-35As or three and one-half F-35Cs. Though these prices will likely decrease once the aircraft enters full-scale production in a few years, this is a prime example of how the Air Force potentially could refocus its financial efforts to a new collection pod. Adding this collection pod to existing combat aircraft increases flexibility and agility not only in today's fight, but future fights as well.

The threat-permissive environment currently enjoyed by ISR assets today cannot be relied upon for future operations. This will make the majority of RPAs incapable of delivering on their ISR mission, causing commanders to rely more on other sources for ISR, such as stand-off ISR from the RC-135, P-3, E-8, or U-2. Unfortunately, a nonpermissive environment may preclude these high-value airborne assets (HVAA) from penetrating too deeply into contested airspace. This would cause a heavy

reliance on ISR support from other means, such as satellites. Satellite assets may or may not be available or provide the necessary fidelity or even amount of information to the commander. A collection pod strapped to any strike asset (independent of service) would help to resolve this conundrum, provided it is a capability that is integrated in the same manner as the Sniper XR. However, the capability needs to be taken one step further.

Any targeting, sensor, or jamming pod can provide instant flexibility and modularity. It provides flexibility, much in the same manner that the Sniper XR augments onboard sensors. In a contested environment, the collection pod could serve as an additional RWR to the host aircraft while collecting information. This data could transfer via a link similar to, yet separate from, something such as Link-16. The various pods would share information on this link and transfer this data to the aircraft (plus additional assets), such as SIGINT from one geographic area and COMINT from another. Cross cueing of these sensors could provide the host aircraft (or flight of aircraft) with additional threat information, but also the ability to rapidly target these enemy systems and significantly reduce the time involved with the find, fix, track, target, engage, and assess kill chain (F2T2EA).

In addition to reducing the kill chain, a collection pod benefits both ISR planners and operations. Currently, there is a discrepancy between Air Force doctrine and the way it conducts ISR operations. Despite a January 2012 rewrite, Air Force Doctrine Document (AFDD) 2-0, *Global Integrated Intelligence, Surveillance, & Reconnaissance Operations*, still separates ISR from the rest of Air Force operations. For example, the Air Force has eliminated references to “in direct support of . . . operations” from its definition of ISR, something that the joint definition still includes.⁴¹ Instead, the Air Force opted for a “global integrated ISR” posture, arguing it is a “cross-domain synchronization and integration of the planning and operation of ISR assets” and sensors.⁴² There are several references to global and more traditional ISR platforms, such as the U-2, RQ-4, and MQ-9. However, the Air Force’s perspective on global integrated ISR claims that it is “domain, service and platform neutral.”⁴³ In fact, there is not a single reference to NTISR in the current publication. An integrated ISR pod would help bring the “in direct support of operations” piece back into the definition, providing a capability that is truly domain, service, and platform neutral.

While the actual non-ISR asset may not be available for retasking, its sensor may be available. This could be accomplished through various means: reprogramming, data link, satellites, and so forth. Ownership of the actual platform is not required. Instead, the platform (A-10, F-16, B-52, etc.) acts as a sensor bus for the collection pod, gathering data as

part of its originally planned mission or through dynamic tasking. For larger aircraft, such as the B-1, use of the extra external hardpoint allows it to carry not only the Sniper XR but the additional collection pod. If this is not possible, the advantage of flying in formation (two-ship or more) allows use of both the Sniper XR and collection pod, depending on the configuration and aircraft load out; this holds true for fighter aircraft as well. The added benefit of the collection pod far outweighs the cost of removing one weapon from a fighter or a Sniper XR from a two-ship of bombers (where the load out is not affected).

Integration into an established aircraft system provides a certain amount of control, but a predetermined amount of automation makes this capability more viable in a semi- or nonpermissive threat environment. Automating the collection pod precludes any added work for the aircrew, something that causes issues in a semi- or nonpermissive environment. If the collection pod were integrated with the aircraft systems, especially the INS and Global Positioning System (GPS) feeds onboard all military aircraft, it could know its position at all times and be able to “sniff” for different types of information (ELINT, COMINT, etc.) at predetermined geographical points. It could also be fitted with a separate GPS antenna that has selective availability antispoofing module (SAASM) abilities, similar to that currently used on equipped joint direct attack munitions (JDAM).

In addition to communicating between pods for real-time data, these collection pods could store information on board for later processing. This would not only provide redundancy in between different collection pods, but provide a sound system of information distribution in case the pod link fails. Data storage onto the pod itself and downloading the data postmission are options. While this would not necessarily add to the current fight, it could prove beneficial for future operations later in the ATO cycle. Parametric data, location, emission times, and other data could also be brought back and exploited through ground-based systems. This is not impossible considering the potential for contested electronic warfare (EW) environments.

While the concept of a new collection pod seems reasonable but highly unrealistic, it deserves consideration for integration in today's Air Force arsenal. NTISR, through the use of externally mounted pods such as the Sniper XR, is a proven combat capability. However, it is often overlooked because it does not deliver the same level of effects that traditional ISR assets provide. Bridging these gaps through a modular sensor with potential link and data storage / transfer capabilities helps solve the issues of restricted capabilities and fleeting data. Organization and ownership issues begin to dissolve because a collection pod redefines what non-

traditional assets bring to the ISR fight, providing the potential to collect additional data not normally associated with a traditional strike asset. Becoming a more agile and flexible Air Force in the wake of looming budget cuts depends on creative use of decreasing platform and personnel strengths. If the Air Force is serious in pursuing true multirole capabilities and sacrificing niche ones, it must consider options that further its ability to conduct operations not only in the current fight and with current platforms but future fights as well.

Notes

(All notes appear in shortened form. For full details, see the appropriate entry in the bibliography.)

1. "Air Force Priorities for a New Strategy with Constrained Budgets," White paper, 2.
2. "Active Duty Military Personnel, 1940–2011," *Infoplease*.
3. The term *platform* is not exclusive to aircraft but is focused primarily on those that support operations (aircraft, satellites, operations centers, and so forth).
4. Briefing, General James.
5. Ibid. Other commands supported include Air Force Special Operations Command, United States Air Forces Europe, Pacific Air Command Air Forces, Air Mobility Command, Air Force Materiel Command, and Air Force Reserve Command.
6. Hill, "Airman's View of NTISR," 5.
7. Rosenau, *Special Operations Forces and Elusive Enemy Ground Targets*, 33–4.
8. Ibid., 40–42.
9. "Air Force Fact Sheet: LANTIRN."
10. "AN/AAQ-28(V) LITENING Targeting Pod," Northrop Grumman.
11. Sniper XR uses image-processing algorithms to enhance displayed images. The XR (extended range) feature of the Sniper XR digitally combines four magnified frames around the crosshairs to enhance the image, but can be influenced by range to the viewed target as well as relative motion.
12. IMINT (imagery intelligence) "involves the collection and analysis of images that are recorded and stored." Air Force Doctrine Document (AFDD) 2-0, *Global Integrated Intelligence, Surveillance, and Reconnaissance (ISR) Operations*, 39.
13. This is based on personal experience.
14. Hill, "Airman's View of NTISR," 6.
15. Hinote, *Centralized Control and Decentralized Execution*, 41.
16. Air Force Tactics, Techniques and Procedures (AFTTP) 3-3–AOC, *Operational Employment, Air Operations Center*, 4-44. While I have planned and flown a plethora of missions, I have never actually seen this spreadsheet.
17. A troops-in-contact (TIC) situation is the highest-priority mission at a given time. Strike assets can get pulled from relatively high-priority joint tactical air requests to support a TIC because friendly troops are in direct contact with the enemy. While these situations do not always require a kinetic option, it is a possibility.
18. 505th Operations Squadron Joint Integration Team, "Step-by-Step Guide."
19. While several missions were labeled as NTISR on the Mission Analysis Tool, they were usually labeled that after an aircraft conducting on-call close air support was rerouted to NTISR.
20. Hill, "Airman's View of NTISR," 5.
21. While the MQ-9 may carry both AGM-114 and GBU-12, its load out is significantly smaller than even the smallest strike aircraft.
22. Schanz, "New Normal for RPAs," 52.
23. McCullough, "Remotely Piloted Aircraft Fleet Nears Combat Milestone."

24. 480th Intelligence, Surveillance, and Reconnaissance Wing Instruction 14-101, *Integrated Intelligence, Surveillance, and Reconnaissance (ISR) Operations*.

25. I personally flew several missions in OEF where the same data was reported several times to a specific Army or Marine unit without ever making it to the aircrew. Therefore, we duplicated our efforts quite often when conducting XCAS or NTISR in support of ground units. Often the same LOC would be scanned with the same potential improvised explosive devices' locations gathered by different aircrew on different air tasking order days.

26. Costlow, "Kehler Raises Trial Balloon."

27. Other teams involved include the imagery support element, processing, exploitation, and dissemination (PED) liaison officers (LNO), ISR operations duty officers, senior intelligence duty officers, ISR division LNOs, specific platform LNOs, and other PED nodes.

28. Schanz, "New Normal for RPAs," 53.

29. Costlow, "Kehler Raises Trial Balloon."

30. Blackhurst, Gresham, and Stone, "The Autonomy Paradox," 21.

31. "GEOINT Community Hammers Out Integration Strategies," Semantic Community.

32. Fulghum, "Afghan War Demands Flexible Weaponry."

33. "Air Force Priorities for a New Strategy with Constrained Budgets," white paper.

34. Department Of the Air Force, *Fiscal Year 2012 Air Force Posture Statement*, 1.

35. "Air Force Priorities for a New Strategy with Constrained Budgets," White paper, 4.

36. Ibid., 3.

37. Ibid., 4.

38. This pod would not include integration on "stealth" aircraft for obvious reasons.

39. "Sniper XR," Deagel.com.

40. Briganti, "Analysis: F-35 LRIP [low-rate initial production] 5 Contracts."

41. AFDD 2-0, *Global Integrated ISR Operations*, 1; and Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 139.

42. AFDD 2-0, *Global Integrated ISR Operations*, 1.

43. Ibid., 3.

Abbreviations

ACC	Air Combat Command
AF/A2	USAF Deputy Chief of Staff for Intelligence, Surveillance, and Reconnaissance
AF/A3/5	USAF Deputy Chief of Staff for Operations, Plans, and Requirements
AFRC	Air Force Reserve Command
AMC	Air Mobility Command
ANG	Air National Guard
AOC	air operations center
AOR	area of responsibility
ATO	air tasking order
ATP	advance targeting pod
BCA	Budget Control Act
CAP	combat air patrol
CAS	close air support
COIN	counterinsurgency
COMINT	communications intelligence
CONOPS	concept of operations
DNI	Director of National Intelligence
DOD	Department of Defense
ELINT	electronic intelligence
EO/IR	electrooptical/infrared
EW	electronic warfare
F2T2EA	find, fix, track, target, engage, and assess kill chain
FLIR	forward-looking infrared
FMV	full motion video
GBU	guided bomb unit
GEOINT	geospatial intelligence
GMTI	ground moving target indicator
GPS	Global Positioning System
HVAA	high-value airborne asset
IC	intelligence community
IED	improvised explosive device
IMINT	imagery intelligence
INS	inertial navigation system

ISR	intelligence, surveillance, and reconnaissance
ISRD	intelligence, surveillance, and reconnaissance division
IT	information technology
JDAM	joint direct attack munition
JSTARS	Joint Surveillance Target Attack Radar System
JTAR	joint tactical air strike request
LANTIRN	low-altitude navigation and targeting infrared for night
LCTP	laptop controlled targeting pod
LD/HD	low-density/high-demand
LIDAR	light detection and ranging
LNO	liaison officer
LOC	line of communications
LRIP	low-rate initial production
LSS	laser spot search
LST	laser spot tracker
NGA	National Geospatial-Intelligence Agency
NRO	National Reconnaissance Office
NSA	National Security Agency
NTISR	nontraditional intelligence, surveillance, and reconnaissance
OEF	Operation Enduring Freedom
OIF	Operation Iraqi Freedom
OPR	office of primary responsibility
PED	processing, exploitation, and dissemination
POI	points of interest
ROVER	remotely operated video enhanced receiver
RPA	remotely piloted aircraft
RWR	radar warning receiver
SA	situational awareness
SAASM	selective availability antispoofing module
SAR	synthetic aperture radar
SECAF	Secretary of the Air Force
SIDO	senior intelligence duty officer
SIGINT	signals intelligence
SODO	senior operations duty officer
TIC	troops in contact
TOC	tactical operations center

TTP	tactics, techniques, and procedures
VDL	video downlink
WSV	weapon system video
XCAS	on-call close air support
XR	extended range

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